
VICTORIAN ENTOMOLOGIST



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News Bulletin of The Entomological Society of Victoria Inc.

THE ENTOMOLOGICAL SOCIETY OF VICTORIA (Inc)

MEMBERSHIP

Any person with an interest in entomology shall be eligible for Ordinary membership. Members of the Society include professional, amateur and student entomologists, all of whom receive the Society's News Bulletin, the Victorian Entomologist.

OBJECTIVES

The aims of the Society are:

- (a) to stimulate the scientific study and discussion of all aspects of entomology,
- (b) to gather, disseminate and record knowledge of all identifiable Australian insect species,
- (c) to compile a comprehensive list of all Victorian insect species,
- (d) to bring together in a congenial but scientific atmosphere all persons interested in entomology.

MEETINGS

The Society's meetings are held at La Trobe University, 2nd Floor, 215 Franklin Street, Melbourne (Opposite the Queen Victoria Market) Melway reference Map 2F B1 at 8 p.m. on the third Friday of even months, with the possible exception of the December meeting which may be held earlier. Lectures by guest speakers or members are a feature of many meetings at which there is ample opportunity for informal discussion between members with similar interests. Forums are also conducted by members on their own particular interest so that others may participate in discussions.

SUBSCRIPTIONS

Ordinary Member	\$20.00
Country Member	\$16.00 (Over 100 km from GPO Melbourne)
Student Member	\$12.00
Associate Member	\$ 5.00 (No News Bulletin)

No additional fee is payable for overseas posting by surface mail of the news bulletin. Associate Members, resident at the same address as, and being immediate relatives of an ordinary Member, do not automatically receive the Society's publications but in all other respects rank as ordinary Members.

Cover design by Alan Hyman.

Cover illustration of the Blue Triangle butterfly, *Graphium sarpedon* L. by Rhonda Millen.

MINUTES OF THE GENERAL MEETING, 19 FEBRUARY 1999

The President, A. Kellehear, opened the General Meeting at 8:07 pm

Present: P. Carwardine, D. Dobrosak, I. Endersby, A. & E. Farnworth, P. & E. Grey, A. Kellehear, R. McMahon, S. Smith, D. Stewart, R. Vagi, G. Weeks.

Visitors: Dr. L. Cookson, Dr. A. Duale, M. K.

Minutes:

Minutes of the 11 December 1998 General Meeting [*Vic. Ent.* 29(1): 1-2] were accepted (Stewart/Endersby).

Treasurer's Report: The Treasurer reported that the accounts were with the auditor.

Editor's Report:

The Editor reported that there were insufficient papers were in hand for the next few issues of *Victorian Entomologist*. If any readers are considering writing a paper, notes on observations etc. the Editor would be pleased to assist in advice etc. Thanks were extended to Rhonda Miller for providing an illustration of the Blue Triangle for the front cover of the *Victorian Entomologist*.

Correspondence:

- Letter from Mr B. Brunet accepting the Le Souëf Award.
- Letter from the Field Naturalists Club of Victoria inviting the Society to submit a nomination for the award of the Australian Natural History Medallion.
- Letter from the Department of Justice Victoria, Business Affairs notifying the Society that a Grievance Procedure must be incorporated in the Rules of the Society.

General Business:

Membership: Mr G. Weeks was elected to membership. Applications for membership were received from Heather Arnold, Brian Falkner and Steven Ouwerkerk.

Life Membership: In recognition of the services of Tim New and Peter Carwardine, a vote to endow Life Membership on these two members was called. After a show of hands, the President announced that Tim New and Peter Carwardine were unanimously elected Life Members. Peter Carwardine thanked the Society for the honour.

Speaker: "An introduction to Apiculture" by David Stewart

David Stewart was once an apiarist and presented a well-researched talk on all aspects of bee keeping. The Egyptians practiced bee Husbandry 4000 years ago. Commercial apiculture makes use of about several races of the honeybee *Apis mellifera*. These races most used by commercial beekeepers all originated in Europe. Two of the common races are Caucasian and Carniolian. An interesting fact is that between 1880-1884, Ligurian bees (*Apis mellifera ligustica*) from Bologna in the province of Liguria in northern Italy were introduced onto Kangaroo Island. An act of parliament in 1885 declared the island a

sanctuary for Ligurian bees and no other races of honeybees have been allowed to be introduced on the Island. The isolation of the races on the island makes these bees an important genetic resource for queen breeders.

The Honeybee has a three-cast system, queen, (fertile female) workers (infertile female) and drones (fertile males) with the majority consisting of workers, which forage to collect pollen. David spoke about the problems associated with beekeeping including the need to manipulate combs to ensure cells remain large and adults do not become smaller in size over time thus reducing honey yield.

Apart from honey, David informed those present of other products produced by bees eg. Beeswax, Pollen, Propolis (a brownish gum gathered by bees from plants and used to close the openings of the hive) and royal jelly (a milky white secretion produced by young nurse bees that is fed to larvae to make queens).

David supplemented his talk with slides and samples of bees and various types of honey.

The president thanked David for his highly informative talk and the effort taken by David in providing the slides and display of honey.

Observations/Displays: Ed Grey brought a copy of a new book Titled Australian Ants: Their Biology and Identification by S. O. Shattuck. The publisher is CSIRO and the recommended retail price is \$89.95 (FNCV member's price is \$75).

The meeting was closed by the President at 9:36 pm.

MINUTES OF THE COUNCIL MEETING, 19 MARCH 1999

The President, A. Kellehear, opened the General Meeting at 8:12 pm

Present: P. Carwardine, D. Dobrosak, I. Endersby, A. Kellehear, D. Stewart, J. Tinetti.

Apologies: R. McMahon.

Minutes:

Minutes of the 20 November 1998 Council Meeting [*Vic. Ent.* 28(6): 102-103] were accepted (Endersby/Dobrosak).

Treasurer's Report:

The Treasurer presented the financial statement as of 19 March 1998: Account balances stand at: General Account \$4,741; Le Souëf Award Account \$3,403. I. Endersby advised that the Society's finances were stable and recommended that no changes be made to the current subscription rates for this year (Endersby/Kellehear).

Editor's Report:

The Editor reported that further papers were required for the June issue of the *Victorian Entomologist*.

General Business:

Nomination for the award of the Australian Natural History Medallion: The Society received a request from the FNCV to put forward a Nomination for the award of the Australian Natural History Medallion. After discussing the issue Council resolved that the Society would decline to submit a nomination this year but will consider preparation of a submission at a later date.

Department of Justice Victoria, Business Affairs: The Department of Justice, Victoria notified the Society that a grievance procedure must be included in the Society's rules. I. Endersby agreed to write to the Department as this latest advice contradicts earlier written advice from the Department.

Program of speakers for 1999: The Program for the remainder of the year was discussed and confirmed: A summary of the program is as follows:

June: Presidential address: "In the Mood – the Musical portrayal of Insects".
August: Talk by Dr. G. Ambrose, from the University of Ballarat on Butterfly Research in the Ballarat region.
October: Visit to the CSIRO's Forestry and Forest Products collection at Clayton.
December: Members night – members and visitors bring exhibits & present short talks.

The meeting was closed by the President at 9:09 pm.

A Visit to Geraldton, W.A. 1 – 10 January, 1998

A visit to Geraldton produced the following species.

Observed in the town,

Pieris rapae

Catopsilia sp. (looked like *pyranthe*)

Eurema smilax

Vanessa kershawi

Nacaduba biocellata

Lampides boeticus

On the way back from a trip to Three Springs (to see some very successful plantings of native trees on the overburden from a talc mine spread deeply over a one totally bare salt pan), I walked up to the lookout on Mingenew Hill, 120 km. SE of Geraldton. It was a cloudy and windy day, and all I saw was one female of *Ogyris amaryllis* resting on the mistletoe *Loranthus fitzgeraldi* on "Jam" (*Acacia acuminata*). A few days later I took more of this species at Chapmans River Reserve, North Geraldton. This time the insects were visiting the mistletoe *Loranthus linearifolius*, which was also on "Jam".

My thanks to Mrs Jenna Brooker for driving me to Three Springs and for identifying the Mistletoes.

Tony Morton

NOTICE OF ANNUAL GENERAL MEETING

Members of the Society are advised that the Annual General Meeting will be held at the La Trobe University, Melbourne Campus, 215 Franklin Street, Melbourne, commencing at 8 p.m. on Friday 16 April 1999.

AGENDA

1. Approval of minutes of AGM held on 19 June 1998
2. Treasurer's Report
3. Editor's Report
4. Reports from Committees
5. Election of Council for 1999-2000
6. Expression of interest for joining Committees
7. General Business

Nominations for positions on the Council, in writing and signed by the proposer, seconder and nominee, must be in the hands of the President seven days prior to the Annual General Meeting. Nomination forms and Proxy forms may be obtained from the President. Nominations may also be accepted at the Annual General Meeting.

**THE ENTOMOLOGICAL SOCIETY OF
VICTORIA INC.
STATEMENT OF RECEIPTS AND PAYMENTS
FOR THE YEAR ENDED 31 DECEMBER 1998**

GENERAL ACCOUNT

INCOME		
Subscriptions		
Member	1998	1189
	1999	261
Institution	1998	149
	1999	88
Donations		10
Brochure Mailout		80
Sale of Back Issues		60
Australian Museum Donation		60
Interest		5
		1902

EXPENDITURE

Journal Costs		
Printing	840	
Postage	374	
Envelopes	<u>230</u>	1444
Lecture Room Hire		220
Corporate Affairs		
(General)	32	
(Constitution Change)	30	62
Stationery & Postage		75
Aust Ent Soc Sub.		55
Associations Incorporation Act		21
Organ Pipes Nat. Park Survey		31
Bank Fees		8 1916

SURPLUS (DEFICIT) FOR YEAR (14)

Add Balance brought forward from 1997 4726

Balance carried forward to 1999 4712

LE SOUËF MEMORIAL FUND

INTEREST INCOME

Treasury Corporation of Victoria	126
Commonwealth Bank Fixed Deposit	37
Commonwealth Bank Savings Account	1 164

Less

Award Expenditure	16
Science Talent Search	50 66

SURPLUS(DEFICIT) FOR YEAR 98

Add balance brought forward from 1997 908

Balance carried forward to 1999 1006

**STATEMENT OF ASSETS AT
31 DECEMBER 1998**

GENERAL ACCOUNT

Bank Account	4712
Editor's Advance	104
Stock of Maps	40
	<u>4856</u>

LE SOUËF MEMORIAL FUND

Bank Account	1006
Fixed Deposit Stock	
Treasury Corporation of Victoria	1400
Commonwealth Bank Savings Account	1000 2400
	<u>3406</u>

AUDITOR'S REPORT

I report that I have audited the 1998 accounts of the Entomological Society of Victoria, comprising the Statement of Receipts and Payments, Statement of Assets, and Statements for the Le Souëf Memorial Fund.

The audit procedure included an examination of the account books and records of the Society, including bank statements, bank books and cheque books.

In my opinion the accounts are properly drawn up and the financial records of the Society are in accordance with applicable accounting standards.

S.J. Cowling

Reflective Eye Patterns in Australian Adult Satyrinae and some Observations on the Genera *Geitoneura* Butler and *Heteronympha* Wallengren (Lepidoptera: Nymphalidae: Satyrinae)

R. GRUND

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Abstract

Some interesting new observations are made on the Australian Satyrinae, but in particular for the genera, *Geitoneura* and *Heteronympha*.

Introduction

The author has recently spent a large amount of time reviewing the taxonomic status of the above two genera, and had prepared a paper on those results which has met resistance among our more learned scholars. As the full version of that paper is not likely to be published in the near future, some of the key results of those studies are now presented for the benefit of lepidopterists around Australia.

Included in the review was the use of reflective eye patterns (REP) in the living adult butterflies, initially studied by Yagi and Koyama (1963), and Sibatani (1973). The REP of butterflies were grouped by these authors into three basic types. Type I (black or uniformly dark coloured eyes with no reflective pattern except for a reflective white hexagonal shape on the surface of the eye), Type II (red, or metallic green or blue coloured eyes with a large central black spot), Type III (pale coloured eyes, of some shade of grey, yellow or brown, in which occurs a complex pattern based on a central larger black spot surrounded by six smaller spots grouped in a regular hexagonal configuration). The present author wishes to redefine this grouping to the following. Type I (as above but also to include the red eyes), Type II (eyes having a metallic, green or blue or copper surface colouration), Type III (remaining as above).

Type I eyes are found in all the skipper and true butterfly families. Skippers only have this type of eye, and it is the dominant pattern for Papilionidae. These eyes have no reflective iridescent pigments in the outer dioptic portion of the eye. Type II eyes are only found in the Nymphalidae and Lycaenidae. These eyes may or may not have iridescent pigments in the outer dioptic portion of the eye. Type III eyes are also found in all the true butterfly families, but not in the skippers. These eyes have iridescent pigments in the outer dioptic portion of the eye. The Type III eye is the more evolutionary advanced eye due to the presence of the iridescent pigments. Yagi and Koyama, and Sibatani, along with the present author, have found that REP are good indicators of specific groupings, although these conclusions have been ridiculed by other lepidopterists.

These eye patterns can be readily seen in any good image of a living butterfly, and good examples of all eye types can be seen at the author's web site (<http://www.adelaide.net.au/~reid>) or in Valentine *et al* 1988.

It is possible to categorise the Australian Satyrinae, partially based on REP, presented as follows.

Key to the genera of Satyrinae found in Australia.
 Family Nymphalidae: Subfamily Satyrinae

1. Veins of forewing not swollen at base, eyes smooth, REP Type III.....*Melanitis*
2. Only one vein of forewing swollen at base, eyes smooth, REP Type III.....*Elymnias*
3. Only two veins of forewing swollen at base, eyes smooth, REP Type III.....*Ypthima*
4. Three veins of forewing swollen at base
 - (1) Veins CuA1 and M3 of hindwing approximate at base
 - i. Eyes smooth, REP Type III.....*Orsotriaena*
 - ii. Eyes hairy, REP Type III.....*Mycalesis*
 - (2) Veins CuA1 and M3 of hindwing widely separate at base
 - i. Apical tibial spurs present on mid and hind-legs
 - (i) Antennae with clubs long, gradual and slender
 - a. Eyes smooth
 - (a) Hindwing cell equal to or shorter than vein M3, no androconial sex marks present on male forewing
REP Type I.....*Tisiphone*
 - (b) Hindwing cell normally longer than vein M3, androconial sex marks present on male forewing
REP Type I.....*Geitoneura minyas* group
REP Type III.....*Geitoneura klugii* group
 - b. Eyes hairy
 - (a) Sexes not dimorphic, REP Type I.....*Heteronympha paradelpha* group
 - (b) Sexes dimorphic, REP Type III.....*Heteronympha merope* group
 - (ii) Antennae with clubs short, broad and abrupt
 - a. Vein M1 of forewing either equal to or shorter than vein M2
 - (a) Eyes smooth, REP Type I.....*Oreixenica*
 - (b) Eyes hairy, REP Type ?.....*Nesoxenica*
 - b. Vein M1 of forewing longer than vein M2
 - (a) Eyes hairy, REP Type I.....*Argynnia*
 - ii. Apical tibial spurs absent on mid and hind-legs
 - Eyes smooth, REP Type I.....*Hypocysta*

Discussion

The *Geitoneura minyas* and *Geitoneura klugii* (*G. klugii*, *G. acantha*) groups are easily distinguished by the different REP (Figs 2, 3). The two groups are related by the similar form of the male genitalia, wing venation in the adults, and by the similar egg structure (being turbinate, basally and apically flat, thick shelled, with well developed vertical ribs, which is unique within Australian Satyrinae). The *G. minyas* group is the more primitive group of the two groups based on the form of the male genitalia and the REP.

Prior to the recognition of the different REP, it was difficult to distinguish adult *P. minyas* from the pale forms of *G. klugii* found on the Nullarbor Plain of South Australia and Western Australia. Apart from different genitalia (reasonably accessible), the differences are based on morphology and are not always consistent. These morphological differences, are the distinctly yellowish lower wing-surface in *G. minyas* (not present in *G. klugii*), the yellow inner-margin area of 1A+2A on the forewing upper wing-surface of *G. minyas* (occasionally seen in *G. klugii*), and the normally present extra ocelli in hindwing space M1 in *G. minyas* (never present in *G. klugii*).

The REP also serve to distinguish between the *Heteronympha paradelpha* (*H. cordace*, *H. penelope*, *H. banksii*, *H. solandri*, *H. paradelpha*) and *Heteronympha merope* (*H. merope*, *H. mirifica*) groups. The two groups are related by the form of the male genitalia and the wing venation in the adults. However, there are marked adult morphological differences between the sexually dimorphic *H. merope* group, and the sexually non-dimorphic *H. paradelpha* group. The *H. merope* group are also characterised by considerable ovarian dormancy in the females which has been reported in detail for *H. merope* by Edwards 1973, Fisher 1978, and James 1988. This feature has not been reported in the *H. paradelpha* group. The REP therefore serves to confirm the major differences between these two groups and warrants the designation of a new genus for the more primitive *H. paradelpha* group. Interestingly, there is a large amount of character diversity between individual species within the two groups. No two species have identical sex marks in the males (except for *P. banksii* and *P. solandri*, see below) or identical wing venation. The butterflies also have diverse wing shapes and the ocelli centres of adults may be either white or blue, there are differences in the female forelegs, eggs may be green or white, differences in the first instar larvae, that the larvae (between species) may be horned or not horned, pupae may be cremastered or not, and colour polymorphism in larvae and pupae.

Heteronympha cordace, in having a small size, plain rounded shape, a lack of male sex marks, a less clubbed fore-tarsi in the female (compared to the remaining species other than *H. penelope*), a cremastered pupa, and also based on the form of the male genitalia, would indicate it is the most primitive member of the *H. paradelpha* group. The female fore-tarsi is further unusual in having only four segments, which could be considered a specialisation. These above characters in combination with a dependence on Cyperaceae foodplants (in contrast to all the other species which prefer Poaceae), might suggest it should be placed in a separate genus, however, as for *H. mirifica* below, it would be best to leave it in *Heteronympha* to be recognised as the primitive end member of the genus. Male genitalia from Tasmanian forms differ from mainland forms (Fig.16) in that the spine of the ampullary process on the male genitalia valva is directed inwards like that of *H. penelope*.

H. penelope is anomalous in having a number of primitive features like large, robust male genitalia (although it may be large to be able to produce the female sphragis), very tenacious of life, and better developed fore-tarsi in the female (compared to all the other species), yet also has some specialised features like a large (non-androconial) sex mark in the male, a sphragis in the female (Fig. 1, also see the website <http://www.adelaide.net.au/~reid>) the only Satyrid butterfly known to the author to possess one, and a non-cremastered pupa. (The sphragis could perhaps be considered a pseudo-sphragis as it actually encircles the female abdomen and is removable by hand, although in real life it is probably permanent). This combination of features would suggest it evolved independently from an ancestor prior to *H. cordace*. There is some variability in the male genitalia between the Tasmanian forms of *H. penelope* and the mainland forms, in that the lower arms of the tegumen (carrying the apex angularis) in the Tasmanian forms are much shorter and which are more compatible with other species in the *H. paradelpha* group, and the ampullary process on the valva is usually directed posteriorly (Fig. 19). In mainland forms the ampullary process is often directed sideways (Fig. 18), sometimes even recurved so it points anteriorly. Some smaller Tasmanian adults of *H.p. panope* (Waterhouse) are very similar in morphology to Tasmanian forms of *H. cordace*.

There are no consistent differences in the male genitalia between *H. banksii* and *H. solandri*, and proportional measurements show the genitalia to be practically identical. Adult morphology is similar on the upper wing-surface, but can differ markedly on the lower wing-surface, although the latter could be attributed to colour polymorphism as is often seen in

H. merope. However, since there are apparently some differences between the early stages of the two butterflies (Tindale 1953, Common and Waterhouse 1981), slightly different flight times, and also because there are other minor structural differences, (like wing shape, venation, and male specialised scaling on the hindwing in *H. solandri*, but which could possibly be the result of environmental polymorphism), the issue of whether these two species are the same would have to be resolved by either an allozyme study or a breeding program.

H. mirifica is also anomalous and a general appraisal of its phylogenetic attributes would suggest it to be more primitive than *H. merope*, yet its diverse general structure suggests it is not the precursor to *H. merope*. Like *H. penelope*, it may have evolved independently of the present known species, possibly along the same lineage that produced *H. paradelpha*. Although its overall form is not too dissimilar to *H. merope*, it does have a unique wing shape and venation (although the latter is consistent with the structural definitions for the venation of the genus), cremastered pupa, a very small androconial sex mark in the adult male in which the androconia are small and unique (Fig. 12), strongly constricted posterior arms to the male valvae, and a horizontally flattened posterior end to the uncus (a trait shared only with *H. paradelpha*). However, in combination with its Type III eyes, generally compatible male genitalia and the strongly dimorphic adults, it would be best to group it with *H. merope* rather than erect another monotypic group.

There are consistent differences in the male genitalia between *H. merope merope* and *H. merope duboulayi* wherein the brachia of the former (in processed genitalia), cross the uncus, but do not in the latter. (A similar difference occurs between *G. minyas* and *G. klugii*. However it should be pointed out that the condition of the brachia crossing the uncus is only seen during *rigor mortis* or after processing, as when the adults are alive the brachia sub-parallel the uncus). Due to marked differences in adult morphology (refer to illustrations in Hay *et al.* 1994 and Common and Waterhouse 1981), in conjunction with the genitalia differences, and the lack of a continuous cline between the two forms (Dunn and Dunn 1991), *H. merope duboulayi* may be better treated as a distinct (sibling) species. *H. m. duboulayi* is one of a number of endemic Western Australian butterflies that include *Antipodia dactyliota* (Meyrick), *Mesodina cyanophracta* Lower (Hesperiidae) and *Theclinesthes hesperia* Sibatani & Grund (Lycaenidae), which have developed in isolation in the south-west portion of Western Australia. Separated from closely related counterparts in eastern Australia, by the periodic northern extension of the Southern Ocean into the Nullarbor area, that occurred during the Eocene to early Miocene Epochs, and the subsequent aridity of the Nullarbor area. This isolation was particularly marked from the end of the Miocene Epoch (5 mybp) (White, 1990). Allozyme testing would resolve its status. The genitalia of the Tasmanian form of *H. merope* are similar to the nominotypical form.

Based on eye patterns and other phylogenetic attributes, it is likely the *Geitoneura klugii* and *Heteronympha merope* groups respectively evolved from the *Geitoneura minyas* and *Heteronympha paradelpha* groups in response to the loss of forests in Australia since the end of the Oligocene Epoch (23 mybp). *G. minyas* is likely the direct ancestor of *G. klugii*.

The use of REP for taxonomic purposes may be too controversial for many lepidopterists, since very few are aware of the existence of REP. However, a data base of world wide butterfly REP information kept by the author, has consistently shown that REP may be regarded as a good character of individual genera, (as also noted by Sibatani, 1973). Ultimately, REP data will aid in further redefining other butterfly genera both within Australia and in other parts of the world, particularly for example, within the overly large *Erebia* Dalman (Nymphalidae: Satyrinae) in the northern Hemisphere and the *Charaxes* Ochseneimer - *Polyura* Billberg complex (Nymphalidae: Charaxinae) in the tropics.

Acknowledgments

Thanks to Joakim Ek and Lindsay Hunt for help with material collection.

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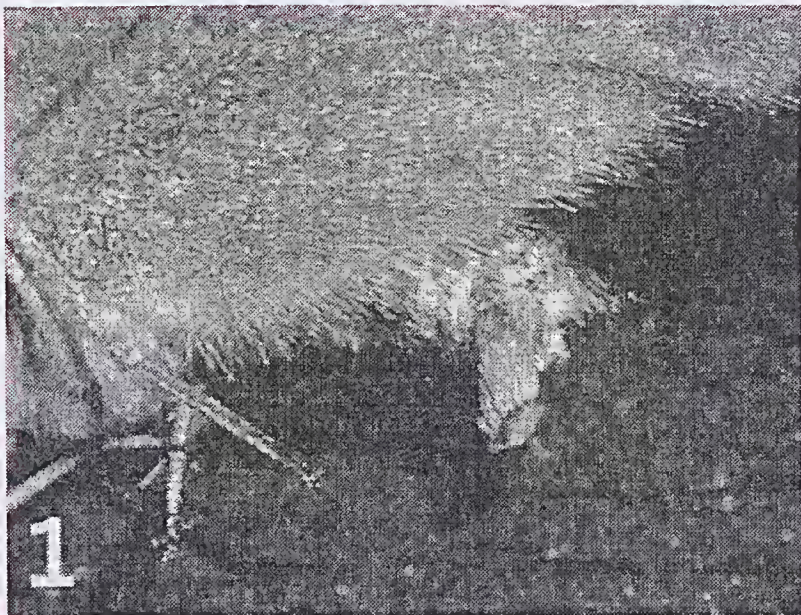


Fig. 1. Female sphragis, *H. penelope* (Grampians);

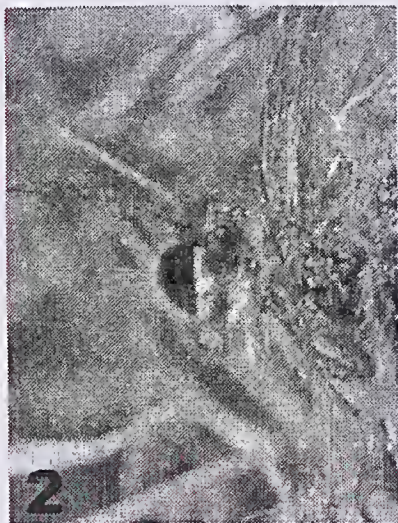
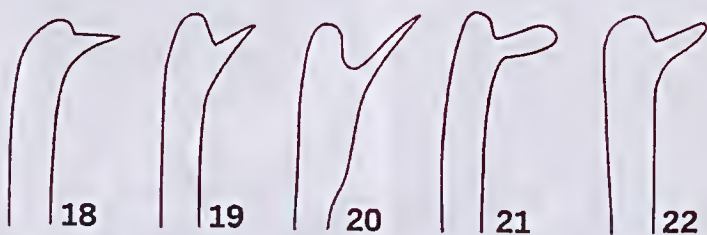
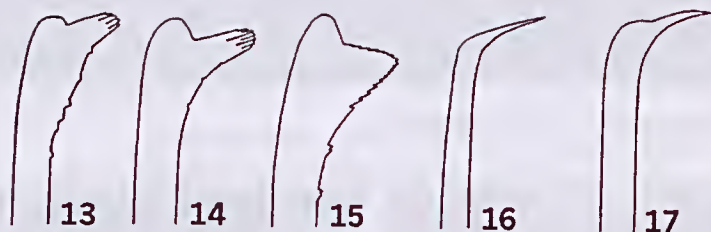
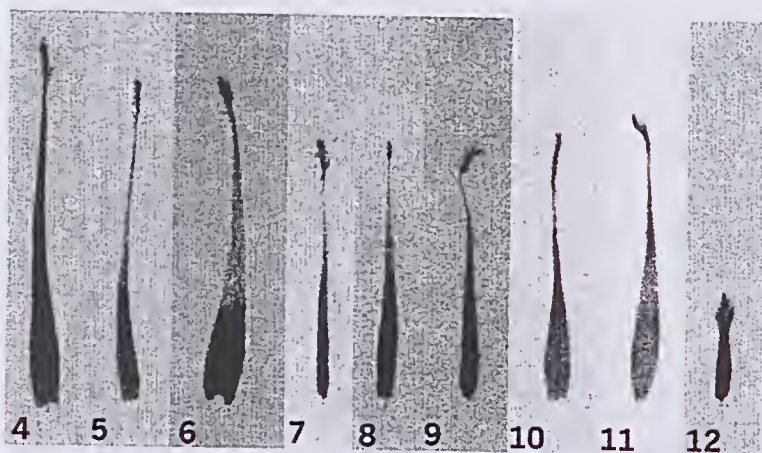


Fig. 2. REP Type I, *G. minyas* (Dongara);



Fig. 3. REP Type III, *G. klugii* (Dongara);



Figs 4-12. Male androconia (at same scale). (4) *G. miryas* (Geraldton, WA); (5) *G. klugii* (Lake Greenly SA); (6) *G. acantha* (Mt. Lofty SA); (7) *H. paradelpha* (Blue Mts NSW); (8) *H. banksii* (Belgrave Vic); (9) *H. solandri* (Buangor Vic); (10) *H. merope merope* (Mt Lofty); (11) *H. merope duboulayi* (Perth WA); (12) *H. mirifica* (Sydney NSW); Figs 13-22. Male genitalia, valval ampullary process (dorsal view, right valva). (13) *G. miryas* (Waddouring); (14) *G. klugii* (Mt Gambier); (15) *G. acantha* (Newcastle NSW); (16) *H. cordace* (Mt Kosciusko NSW); (17) *H. solandri-H. banksii* (Grampians); (18) *H. penelope* (Grampians), (19) *H. penelope* (Mt Wellington Tas); (20) *H. merope* (Gosford); (21) *H. paradelpha* (Blue Mts); (22) *H. mirifica* (Gosford).

Butterfly Watching in Tasmania - Part V

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Part four continued my March 1996 visit from Freycinet National Park near Coles Bay, north along the east coast to St Helens, inland via Scottsdale to Bridport including the Mount Barrow alpine region, and then west through Launceston to Deloraine. In this fifth part, I travel south from this region, ascend the Central plateau, via Breona, to the western shore of Great Lake and explore the Liawenee, Lake Augusta and Miena districts, before venturing south-east via the Interlaken 'isthmus' to eventually arrive at Tooms Lake in the eastern highlands.

Now in search of *Oreixenica ptunarra ptunarra*, the Tasmanian silver xenica, I ascended the central plateau via Golden Valley to the alpine village of Breona. Near Breona, from a vantage point of over 1100m, I was confronted with a massive expanse of still blue water known as the Great Lake - remarkable scenery, no doubt enhanced by the cloudless sky on March 12th. My attention was immediately drawn to the contrasting change from the taller montane forests of the protected slopes to the low windswept shrublands of the high plains which occurred more or less upon entry to the plateau near Projection Bluff. A prime example of altitudinal gradation of vegetation and forest types was seen during my ascent of Mount Barrow, but here, because of the vastness of the plateau before me, it seemed like one had entered another world.

Arriving at the Miena Dam (1034m a.s.l.) in late afternoon (5:30pm), I wandered into an area of *Poa* grassland laden with bidgee widgees - those annoying globular burrs which attach to ones socks and shoelaces like velcro. Irritated, I was busy de-burring my socks, when I glimpsed what seemed like a small grey skipper flying between and around the tussocks. Involuntarily holding my breath, I stalked the darting, low flying, insect to its estimated resting site within a tussock. As my eyes frantically scanned the clump I recognised not an hesperiid, but instead, to my immense delight, a fresh-conditioned perched male of *O. ptunarra*! An immediate rush of exhilaration convinced me that I had achieved my goal and could now go home fully satisfied!

During such moments one can sometimes relate to the rapture experienced by Alfred Russel Wallace. Described in *The Malay Archipelago*, which I read a couple of years earlier, Wallace's oft-quoted troidine encounter in the Aru Islands during the middle of last century is an epitome of hunter enthusiasm. My emotions, thrilling as they were yet pale by comparison, eventually subsided, and as a serenity settled upon me, I focussed attention on observing this ancient butterfly's habits. Having already found one colony at this late hour I decided to commit the next day to studying this endemic species, which was, after all, the prime motivation for my autumn visit!

After some 20 years of regular field observations my cumulative species tally was then (1996) somewhere in the order of 307, having earlier, in 1994, joined the unofficial "300 Club" - an exclusive group of 'butterflies' who have encountered 300 or more of the 400 plus Australian species in the field! Indeed, perhaps serving as a defacto Certificate of Merit I have a CSIRO letter from Dr Ebbe Nielsen which accolades this achievement! Yet even now it is still a thrill to seek out and find taxa new to me. And, the climax of substantiating this whether by net or on

film can be an enormously rewarding and challenging experience often creating a mental state of well being...

O. ptunarra is now an endangered species, threatened by over-grazing, land clearing, plantations and repeated burning to encourage 'green pick' for stock. Tasmanian conservationist, Mark Neyland (1993) commented that the nominate form is seemingly restricted to the eastern central plateau, namely in the vicinity of the Great Lake and Arthurs Lake. This seems extraordinary given the vast expanse of wilderness on the plateau, but the detrimental land management practises of last century are believed to have caused a major contraction in this region creating the currently confined distribution. Much of the central plateau is largely inaccessible and fragmented colonies hopefully remain from which the butterfly may eventually recolonise to become again widespread as the grasslands replenish.

Females of *O. ptunarra* are more easily recognised as a typical satyrine by their orange coloring above and slower flight. Like some other xenicas, they flutter close to the ground over the tussocks depositing their eggs during flight (Prince 1988). The males' in-flight resemblance to a small grey trapezine (closest I think to *Trapezites luteus*) seems remarkable, but serves as an easy means of identifying populations at a distance, especially from a slow moving vehicle as males periodically cross the road. Once I got 'my eye in' I found three more nominate populations on the central plateau including a large healthy colony localised about *Poa* patches amongst heathland at the Liawenee Canal. At this site the Tasmanian silver xenica was accompanied by other alpine species such as *Anisynta dominula pria* (varying in wing condition from fresh to worn) and *Heteronympha penelope panope*, the latter being scarce and in very worn condition.

South of Liawenee, near The Bee Hives, *O. ptunarra* flew in company with old adults of *O. lathoniella barnardi*. Adults of *barnardi* flew higher (about 1-2m above ground) and were not localised about *Poa* patches, but appeared, intermittently, flying amongst shoulder-high *Grevillea* shrubs. An estimated male:female ratio of 3:1 was based on a small sample of only four sexed adults; evidently it was getting late in the season at this altitude and adults of *barnardi* were now quite scarce, but like *ptunarra* (Prince 1988) a strongly male biased figure is usual in the species collectively even late in the season. At this locality too, I was keen to chance on a squat endemic cicada, *Diemeniana hirsuta*, restricted to areas above 950m. Here it called from shrubs bordering tussock grass patches.

With excellent warm-to-hot weather adults of *O. ptunarra* were easy to observe where present, but at most sites where I found the nominate subspecies, they were localised and in low numbers. Along the western shore of the Great Lake, *O. ptunarra* was active from mid morning, i.e. at least from 9:00am (ESST) (= 0800 hrs EST) when I commenced observations through to about 5:30pm (ESST), in late afternoon, when adults begin to settle on grass tussocks for the night. Incidentally, my morning observations are a two hour extension to that of Prince (1988) who recorded adult activity from 1000-1630 hours EST.

Adults of *O. ptunarra* were not seen to feed during late afternoon, but at 9:00am some males fed at the few lingering flowers of the abundant alpine *Grevillea* which dominated the general area. The seeds of this proteaceous plant germinate after fire, and over many decades it has infiltrated much of what were originally *Poa* grasslands. Frequent firing by early pastoralists and graziers since last century has been the culprit. Fortunately for the Ptunarra brown this fire regime has now ceased, but it could be many more decades before most of the *Grevillea* dies off and *Poa* and other earlier successions begin to dominate again.

At midday males were also seen feeding at the introduced yellow flowers of *Hypochoeris radicata* (Asteraceae). Neyland (1992) recorded the latter as the sole known adult nectar source and commented that no other plants were in flower during his visits. Apart from this weed and the *Grevillea* there seemed no other potential nectar sources in the general area where I searched. Evidently in seasons when the flight of *ptunarra* and the late remaining *Grevillea* flowers coincide then these are utilised too. At Miena Dam, the *Grevillea* was utilised as a nectar source by *Vanessa kershawi*, but this nymphaline was observed feeding in late afternoon. Described as "extensive" by McQuillan (1994), the flight period of the Painted Lady in Tasmania continues through to "late autumn" which infers adults can be seen as late as May, but doubtfully so at this higher altitude of 1034m -incidentally, an extension to the "c.3000 ft" (914m) limit recorded for the species by Couchman (1956).

After feeding, male *ptunarra* established perch sites on low vegetation very close to ground. Sites selected were frequently those which provided a vantage point overlooking *Poa* tussocks amongst the stony clearings where denser vegetation including grevilleas had not taken root. The males seemed very alert and settled with wings opened in an acute V, but after some ten seconds or so closed their wings for lengthy periods. Along the western shore of the Great Lake both sexes were in variable condition ranging from fresh to worn suggesting I was towards the middle of their brief flight period, the timing of which varies significantly with altitude and local weather conditions.

I also had time to explore westward from Liawenee to Lake Augusta Dam (1151m a.s.l.). Here I anticipated finding more colonies of *O. ptunarra*, but in heath-marshland I selected at random to explore I met instead with a few adults of *Oreixenica orichora paludosa*. This was a great delight because it was a satyrine I had encountered at only one other site in Tasmania. *O. orichora* adults were lengthy fliers compared with *O. lathoniella* and *O. ptunarra*, and now, at 11:00am, a strong wind was blowing over the treeless landscape making adults extremely difficult to follow and extended observations impossible. They remained settled in windy weather and were encountered only when disturbed. Upon taking to flight they would be blown some 30 metres or more before they could attempt to settle again, at which point they were often lost from sight. The species appeared to be sparse in its habitat, quite unlike my experience with the nominate subspecies on the mainland where it can occur in immense populations. Perhaps in February it is more abundant than I found it to be during mid January and mid March. McQuillan (1994) gave the adult temporal appearance of this species to early March, to which my record serves as a minor extension.

With splendid autumn weather continuing I descended from the Great Lake district towards Interlaken in search of *O. ptunarra roonina*, a slightly larger subspecies than the nominate form and characterised by less sombre males. I searched at several localities between Lagoon of Islands near The Steppes (750m a.s.l.), through to the Alma Tier (950m a.s.l.). My unexpected success gave me the impression the butterfly may occur more or less continuously in this pastoral district, but thereafter it seemed to become sporadic and was last seen about one kilometre south-east of Interlaken (823m a.s.l.).

At four of the five *roonina* populations encountered (i.e. except Alma Tier) the subspecies was locally abundant and males always considerably outnumbered females. The flight season lasts for only about two weeks at any particular site, and Prince (1988) observed the sex ratio can vary from 3 to anything up to 20 to 1 dependent on the site and time of local emergence. Since males emerge before females (Neyland 1993) it is likely I was still rather early in the flight period in The Steppes-Interlaken district, and data in Neyland (1993) is more or less supportive of this conclusion. Here the habitat of *roonina* comprised grassy open woodlands sometimes adjacent

pasture. Indeed, quite dissimilar to the plateau shrublands and grasslands occupied by the nominate populations.

Some readers familiar with Len Couchman's 1956 paper and this xenica might point out that the populations east of The Steppes (which would include the Lagoon of Islands area) were placed with the nominate form by the late authority. More recently, however, Neyland (1992, 1993) allied The Steppes populations with *roonina*. Although the adults are quite variable, in support of this, those I examined in this region (particularly males), seemed much closer to *roonina* (from the Interlaken district). Moreover, the Steppes-Interlaken woodlands differ appreciably from the plateau grasslands so transferring these populations to *roonina* seems logical at face value.

Although I never had the opportunity to meet him, an assessment of Couchman from his writings suggests to me that he was a man of some erudition. And, it seems untenable that he could have mistakenly placed populations to subspecies of which he was the author! I have not re-examined Couchman's material to check this, but perhaps the overall characters of The Steppes population have become more *roonina*-like in the ensuing decades. Such a situation might occur with localised changes in rainfall patterns. Recent quantitative studies by McQuillan and Ek (1997) have shown that much of the species variation is clinal, and that adults from high-rainfall sites tend to be smaller and darker and those from warmer sites are usually larger.

In this same context, I recall reading in Dr E.B. Ford's (1945) celebrated work, *Butterflies*, of a discrete nominate population of the Marsh fritillary (*Euphydryas aurinia*) in Cumberland, England, which went through a sequence of remarkable changes in overall population phenotype after one or more periods of bottle-necking over a 55 year period. In Tasmania, high grazing pressures will cause temporary population crashes and later expansions when pressures lower. This could create a similar situation to that described by Ford and result in phenotypic shifts which may explain both Neyland's and my contrary assessments to those in the 1950's. Objectively, however, recent quantitative studies of the variation by McQuillan and Ek (1997) suggest that the notional subspecies as proposed by Couchman are nonsensical so perhaps this is the explanation?

It would have been romantic to observe *roonina* at Couchman's famous locality, Mike Howes Marsh, near Tarrareah in the Midlands - the population from which he originally described the subspecies in 1953. Regrettably, this was not possible as the type colony became extinct sometime after 1988 (Neyland 1993), graphically illustrating this relict species susceptibility to over-grazing. Indeed, Neyland has already warned that, "without a reduction in the grazing pressure, many extant colonies will soon be extinct." Prince (1988) earlier showed that the principal cause of decline in butterfly populations in Tasmania is habitat destruction, and tragically, Neyland found that 33 of the colonies investigated last decade by Prince have since been lost!

Of the nine sites where I encountered *O. ptunarra*, four of these I had derived from literature sources. The five other colonies were discovered by systematic searching and, of these, two seem undocumented (by either specimen records in museums or in the literature), albeit that they are within a few kilometres of other known sites. In this regard, new metapopulations (temporary or long term) presumably establish periodically as expansions from nearby populations during favourable seasons. Dr Tim New's 1997 revision of *Butterfly Conservation* discusses this natural phenomenon, wherein he cites an example of metapopulation structure reflected in spatial dynamics of a European lycaenid, *Plebejus argus*, over several years in northern Wales, UK.

By mid afternoon of March 13th, and now with considerable experience with this satyrine behind me I decided to venture into the eastern highlands, once again to search for the elusive *O. ptunarra angeli*, but this time in the Tooms Lake district. With sunny weather continuing, I stopped at a lush heath-woodland marsh called Green Tier Creek (according to my map but not sign-posted), situated some 400m a.s.l. - a low altitude for this butterfly, but one from which it is known to occur. This extensive *Poa* area looked promising but, in spite of my successes earlier in the day with the other two taxa, I could not find any adults of the eastern subspecies. Neyland (1993) gives the earliest emergence of *angeli* to be the 16th of March (recorded in 1991) and as the species emergence is exceptionally seasonal, both at and between populations, it seems I had preceded them on the Eastern Tiers by a few days that season. Such disjunct adult temporality over a distance of only about 50 kilometres was completely alien to my mainland satyrine experience.

At Green Tier Creek, the mountain skipper, *Anisynta dominula dominula*, was uncommon along the banks, albeit an exciting find nonetheless, and the only site where I recorded this subspecies. I was particularly interested in observing both subspecies of this Bassian trapezitine, in particular the *pria* on the central plateau mentioned earlier as this, I think, is perhaps the most ancient of all Tasmania's skippers.

The skipper, *A. dominula*, as well as the papilionid, *Graphium macleayanus* and many of the ancient Tasmanian satyrines show clear evidence of glacially isolated relict populations/subspecies or perhaps former semi-species. Today, they seem more or less divided by a SE-NW 'Remington' suture. A 'Remington suture-zone' is a term coined in recent years to describe a belt of interfaunal and interfloral linkage (for more information on this I refer the reader to the classic paper by Charles Remington (1968) which gives detailed discussion and overseas examples). Based on the distribution of these butterflies, I estimate the suture appears to commence somewhere on or near South Bruny Island running through to the general area of Maydena, Tarraleah, Derwent Bridge and Rosebery eventually emerging near Temma on the north-west coast. No doubt the western forms of all the applicable Tasmanian butterfly taxa are the oldest, the eastern forms probably being derived later in part from the mainland or perhaps populated the mainland from eastern Tasmania. If the latter is the case, a 'founder affect', could explain the clearly less differentiated forms present in mainland eastern Australia of such taxa as *A. dominula*, *G. macleayanus*, *Heteronympha cordace*, *H. penelope*, *Oreixenica lathoniella*, *Pseudalmenus chlorinda* (*zephyrus* group only, i.e. not the *myrsilus* group), *Argynnia* etc. which all show greatest variation and subspecific differentiation in Tasmania.

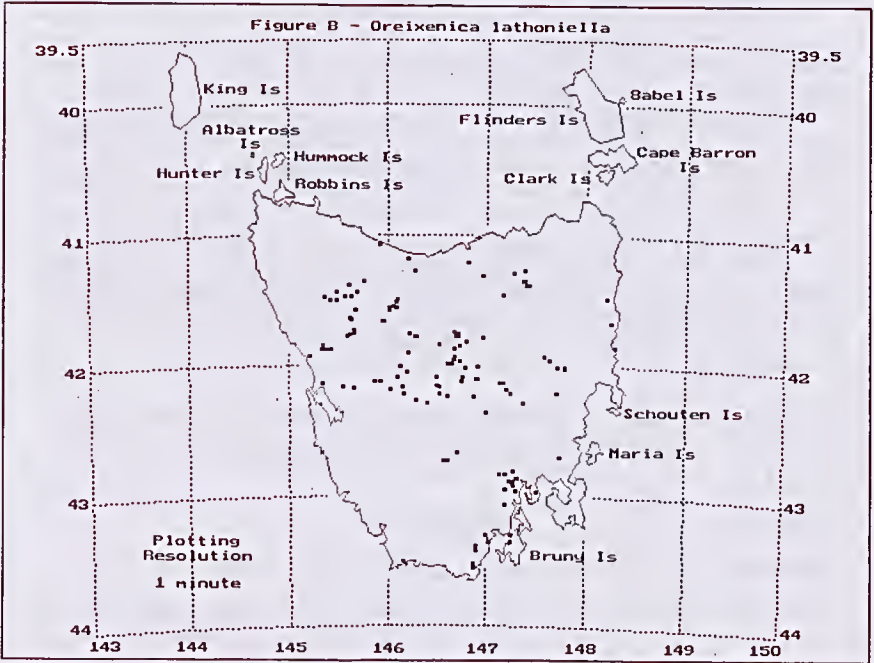
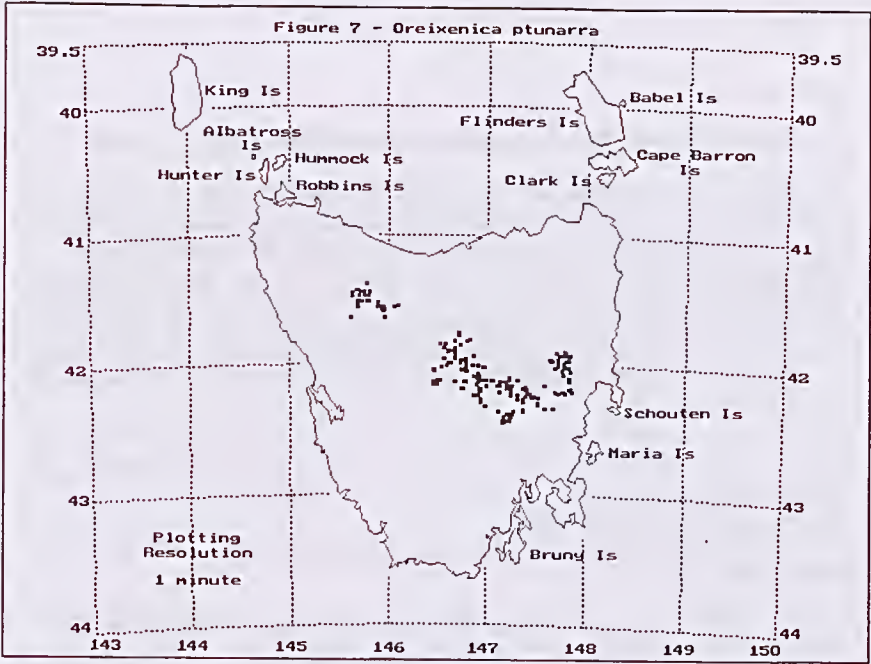
After visiting three more potential *O. ptunarra angeli* sites on the Eastern Tiers, and with dusk rapidly drawing near, I decided to abandon the fruitless search and speedily headed to Devonport for the night. From here, I would be strategically placed to explore the north coast in the morning.

Continued as Part 6

The following maps, based on records held in the Dunn & Dunn National Database, show the available distribution of *Oreixenica ptunarra* (figure 7) and *O. lathoniella* (figure 8) in Tasmania. Figure 7 is a significant update on that provided earlier by Dunn & Dunn (1991) and gives what is possibly an almost complete distribution for a single taxon thanks to the thorough survey work by Tasmanian researchers. Figure 8 shows the available distribution with greater clarity than is appreciable from the earlier national map of 1991. It is evident from the patchy distribution of *O. lathoniella* that many more populations await documentation.

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Notes on *Cicadetta abdominalis* (Distant) at Flowerdale, Victoria

This following is a letter passed on to the Editor concerning cicadas at Flowerdale, Vic. Permission was kindly given by the author for the contents to be passed on to Society members and so is reproduced below. It contains information which may be of interest to those keen on this group. K. Dunn says the species involved was *Cicadetta abdominalis* (Distant) based on two submitted specimens found dead below Eucalyptus in February. These are now in the Victorian Agricultural Insect Collection at Knoxfield. He commented that one specimen showed decomposition including fungal hyphae (the "bit eaten" one). *C. abdominalis* is a common species at times and is well known from this general area north of Melbourne.

"Friday, 12 February 1999-03-29
PLEASE PASS THIS DIRECTLY ON TO -

MR KELVYN DUNN:

Here are the 2 Cicada specimens which I mentioned. These were found at our Farm at Flowerdale - as I stated, they were absolutely IN PROFUSION up there this Christmastime! We've had our Farm for 11/12 years now, and I must say that this is the very first time that I've noticed these Cicadas - and, you wouldn't forget them, either.

We arrived at the Farm on Tuesday 22 December 1998 and from about the 26th December onwards, we started hearing this absolutely deafening "click-click-click-.....noise". It was going continuously "click-click-click-....." and it was coming from everywhere (from the Gumtrees, that is). They were all just clicking away - no singing - but after about a week or so of the clicking, they then started with the normal, Cicada-type singing (no more "clicking"). And this was still going when we finally left the Farm and returned to Melbourne (on 15 January 1999).

There must have been absolutely thousands of these Cicadas around, because no matter where you went in Flowerdale/Glenburn/Yea surrounding areas, this constant noise was around your eardrums all the time. The clicking was so Loud and Constant, that it actually made your eardrums very sensitive! It was unbelievable - and, as I said, it's the first time in 11 or 12 years of us owning the Farm, that we've noticed them (and the locals say that they are not around every year, either).

Hope this is of some use to you. One of the specimens seems a bit "eaten" - the other one, his coloured stripes seem to have faded slightly, because they are really extremely bright those orange stripes.

Kind regards

(signed) Robyn Brandstetter"

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DIARY OF COMING EVENTS

Friday 16 April Annual General Meeting.

Patrick Honan will present a talk on Melbourne Zoological Gardens' Butterfly House.

At the Society's meeting room at La Trobe University, 2nd Floor, 215 Franklin Street,
Melbourne (Opposite the Queen Victoria Market near Queen Street)
Melway reference Map 2F B1

Friday 21 May Council Meeting

Friday 18 June General Meeting

Presidential Address: Allan Kellehear will present a talk on
"In the Mood – the Musical Portrayal of Insects "

Friday 16 July Council Meeting

Scientific names contained in this document are *not* intended for permanent scientific record, and are not published for the purposes of nomenclature within the meaning of the *International Code of Zoological Nomenclature*, Article 8(b). Contributions may be refereed, and authors alone are responsible for the views expressed.